CLAIMS

What is Claimed is:

1. A method for heating a plurality of microelectronic structures attached to a non-metallic substrate, wherein each of the plurality of microelectronic structures is comprised of a metallic material, and ones of the plurality of metallic microelectronic structures are insulated from other ones of the plurality of microelectronic structures, the method comprising the steps of:

placing the non-metallic substrate and the plurality of microelectronic structures in an oscillating electromagnetic field, whereby the plurality of microelectronic structures are heated by the oscillating electromagnetic field and the non-metallic substrate is essentially not heated by the oscillating electromagnetic field;

maintaining the non-metallic substrate and the plurality of microelectronic structures in the oscillating electromagnetic field until each of the plurality of microelectronic structures obtains a defined heat-treatment temperature substantially greater than an ambient temperature;

removing the non-metallic substrate and the plurality of microelectronic structures from the oscillating electromagnetic field; and

cooling the plurality of microelectronic structures to the ambient temperature.

2. The method according to Claim 1, wherein the placing step further comprises placing the plurality of microelectronic structures in the oscillating electromagnetic field, wherein the plurality of microelectronic structures are comprised of a ferromagnetic material.

3. The method according to Claim 2, wherein the placing step further comprises placing the plurality of microelectronic structures in the oscillating electromagnetic field, wherein ferromagnetic material is a nickel-cobalt alloy.

4. The method according to Claim 2, further comprising tuning the oscillating electromagnetic field to selectively heat the ferromagnetic material.

5. The method according to Claim 1, wherein the maintaining step further comprises obtaining the heat-treatment temperature greater than 800°C.

6. The method according to Claim 1, wherein the maintaining step further comprises obtaining the heat-treatment temperature greater than 1300°C.

7. The method according to Claim 1, further comprising generating the oscillating electromagnetic field between a pair of parallel plates.

8. The method according to Claim 1, further comprising generating the oscillating electromagnetic field between arms of a hairpin coil.

9. The method according to Claim 1, further comprising generating the oscillating electromagnetic field using a coil comprised of a copper tube formed into a coil shape.

10. The method according to Claim 1, further comprising tuning the frequency of the oscillating electromagnetic field to a resonant frequency of a field generator circuit.

11. The method according to Claim 1, further comprising tuning the frequency of the oscillating electromagnetic field to between about 10-15 MHz.

12. The method according to Claim 1, further comprising measuring a temperature of the plurality of microelectronic structures by applying a heat-indicating paint to the plurality of microelectronic structures prior to the maintaining step.

13. The method according to Claim 1, wherein ones of the plurality of microelectronic structures comprise separate components temporarily joined by solder paste prior to the maintaining step, and the maintaining step further comprising obtaining a heat-treatment temperature greater than an activation temperature of the solder paste, whereby the separate components are soldered together.